

## CLAIMS

We claim:

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1. An extensible file access method for accessing a foreign file system from a local data processing system with a native file system, said foreign file system being located on a remote data processing system, said foreign file system having a set of foreign file attributes corresponding to each of a plurality of files in the foreign file system, and said native file system having a set of native file attributes corresponding to each of a plurality of files in the native file system, said method comprising the steps of:
    - generating a request from a client on the local data processing system to the remote data processing system to open a foreign file in the foreign file system;
    - opening of the of the foreign file by the foreign file system;
    - sending of the file attributes of the foreign file, hereinafter foreign file attributes, to the local data processing system;
    - storing of the foreign file attributes by the local data processing system;
    - accessing of the foreign file attributes stored in the local data processing system by the local data processing system client to process the foreign file; and
    - processing by the local data processing system client the foreign file using the stored foreign file attributes.
  2. The method of claim 1 further comprising the steps of:
    - determining a subset of the foreign file attributes which are equivalent to a corresponding subset of file attributes of the native file system, the subset of the foreign file attributes hereinafter known as conventional file attributes;
    - returning the conventional file attributes to the client; and
    - storing a remaining subset of the foreign file attributes which are not equivalent to a corresponding subset of file attributes of the native file system, the remaining subset of the foreign file attributes hereinafter known as extended file attributes.

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1 7. An article of manufacture for use in a computer system for accessing a foreign file  
2 system from a local data processing system data processing system with a native file system,  
3 said foreign file system being located on a remote data processing system, said foreign file  
4 system having a set of foreign file attributes corresponding to each of a plurality of files in the  
5 foreign file system, and said native file system having a set of native file attributes  
6 corresponding to each of a plurality of files in the native file system, said article of manufacture  
7 comprising a computer-readable storage medium having a computer program embodied in said  
8 medium which causes the computer system to execute the method steps comprising:

9 generating a request from a client on the local data processing system to the remote data  
10 processing system to open a foreign file in the foreign file system;

11 opening of the of the foreign file by the foreign file system;

12 sending of the file attributes of the foreign file, hereinafter foreign file attributes, to the  
13 local data processing system;

14 storing of the foreign file attributes by the local data processing system;

15 accessing of the foreign file attributes stored in the local data processing system by the  
16 local data processing system client to process the foreign file; and

17 processing by the local data processing system client the foreign file using the stored  
18 foreign file attributes.

19 8. The article of manufacture of claim 7 wherein the method steps further comprise the  
2 steps of:

3 determining a subset of the foreign file attributes which are equivalent to a  
4 corresponding subset of file attributes of the native file system, the subset of the foreign file  
5 attributes hereinafter known as conventional file attributes;

6 returning the conventional file attributes to the client; and

7 storing a remaining subset of the foreign file attributes which are not equivalent to a  
8 corresponding subset of file attributes of the native file system, the remaining subset of the  
9 foreign file attributes hereinafter known as extended file attributes.

Sub A 1 9 The article of manufacture of claim 8 wherein the method steps further comprise the steps of:

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3 accessing of the foreign file by the client via a protocol of the native file system, the  
4 accessing being performed in a similar manner to accessing a native file system file; and  
5 accessing of the foreign file by the client by use of the extended file attributes, the  
6 accessing being performed via a protocol different from the native file system protocol.

1 10. The article of manufacture of claim 8 wherein the storing step further comprises:  
2 starting an expiration timer corresponding to the extended file attributes; and  
3 removing the extended file attributes from the local data processing system storage after  
4 the expiration of the expiration timer.

5 11. The article of manufacture of claim 8 wherein the sending of the foreign file attributes  
6 is performed by a web server located on the remote system, the web server being capable of  
7 sending and receiving messages via a network.

8 12. The article of manufacture of claim 8 wherein the method steps further comprise the steps of:  
9 storing the extended file attributes in a shared memory portion of the local data  
10 processing system storage which is accessible by the client and other local data processing  
11 system processes;  
12 associating a unique handle with the extended file attributes; and  
13 providing the unique handle to a local data processing system process to enable the  
14 local data processing system process to access the extended file attributes.

1 13. A distributed computer system for accessing a foreign file system from a local data  
2 processing system with a native file system, said foreign file system being located on a remote  
3 data processing system, said foreign file system having a set of foreign file attributes  
4 corresponding to each of a plurality of files in the foreign file system, and said native file  
5 system having a set of native file attributes corresponding to each of a plurality of files in the  
6 native file system, said distributed computer system comprising:

7 a requestor for generating a request from a client on the local data processing system to  
8 the remote data processing system to open a foreign file in the foreign file system;

9 a foreign file which can be opened by the foreign file system;

10 a sender for sending the file attributes of the foreign file, hereinafter foreign file  
attributes, to the local data processing system;

storage for storing of the foreign file attributes by the local data processing system;

a file access for accessing the foreign file attributes stored in the local data processing  
system by the local data processing system client to process the foreign file; and

a processor for processing by the local data processing system client the foreign file  
using the stored foreign file attributes.

14. The distributed computer system of claim 13 further comprising:

a comparator for determining a subset of the foreign file attributes which are equivalent  
to a corresponding subset of file attributes of the native file system, the subset of the foreign  
file attributes hereinafter known as conventional file attributes;

a data transfer for returning the conventional file attributes to the client; and

storage for storing a remaining subset of the foreign file attributes which are not  
equivalent to a corresponding subset of file attributes of the native file system, the remaining  
subset of the foreign file attributes hereinafter known as extended file attributes.

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15. The distributed computer system of claim 14 further comprising:  
a file access for accessing by the client the foreign file via a protocol of the native file system, the accessing being performed in a similar manner to accessing a native file system file; and  
a file access for accessing by the client the foreign file by use of the extended file attributes, the accessing being performed via a protocol different from the native file system protocol.

16. The distributed computer system of claim 14 wherein the storage further comprises:  
an expiration timer corresponding to the extended file attributes; and  
storage access for removing the extended file attributes from the local data processing system storage after the expiration of the expiration timer.

17. The distributed computer system of claim 14 wherein the sender of the foreign file attributes is a web server located on the remote system, the web server being capable of sending and receiving messages via a network.

18. The distributed computer system of claim 14 further comprising:  
a shared memory portion of the local data processing system storage which is accessible by the client and other local data processing system processes for storing the extended file attributes;  
a unique handle associated with the extended file attributes; and  
a local data processing system process which uses the unique handle to enable the local data processing system process to access the extended file attributes.